Gamification and Domain Transfer

Developing Strategies and Best Practices

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**Abstract**

Gamification is “the use of gameplay mechanics for nongame applications” (Isabelle, 2020), and it’s a controversial subject in pedagogy. Gamification has as convincing a track record of success as it does of failure, and persuasive non-empirical arguments can be adduced both for and against it. This ambivalence is due partly to the fact that a gamification intervention will succeed or fail due to many features of its context — the discipline it’s used in, the type of class, the background of the students, the broader pedagogical approach of the instructor, the specific gameplay mechanics used in the particular combination they’re used in, and so on. Because of this complexity, empirical studies of gamification are of limited use to a teacher thinking through a gamification intervention in their own context. In addition to those studies, we need general strategies for thinking through gamification interventions in particular contexts. I develop one such strategy by considering gamification as an instance of *domain transfer*. Domain transfer occurs whenever we take resources, tools, or strategies from one domain and apply them in another. And there is a lot to say about domain transfer: about the reasons domain transfers are successful or unsuccessful; about the ways that shortcomings in a domain transfer can be identified and mitigated; and so on. These broader lessons can be applied to gamification. They offer strategies for evaluating gamification interventions, compensating for their shortcomings, and overcoming the problems that empirical research on gamification faces.

Introduction

Anyone interested in both teaching and psychology has probably heard (apocryphal) stories about B.F. Skinner’s teaching philosophy. Skinner was a psychological behaviorist: a proponent of the view for psychology to be scientific, it must only describe the formal relations between input and output in cognitive systems, ignoring the mental operations *between* input and output, and especially the conscious awareness of them. So conditioning in organisms was conceived of solely in terms of *operant conditioning* — the effects of reward or punishment on the responses an organism makes to stimuli. Thus we have the *Skinner box*: a mouse is introduced into an enclosure. It is presented with a light, and a bar that it can either press or leave alone. You reward and punish certain responses — e.g., pressing the bar in response to the light. Responses that are rewarded are seen more often as the trials go on, and those that are punished are seen less. This relationship between past and future stimulus–response pairs is, for the behaviorist, all there is to say about how an organism adapts its behavior to its environment.

 I hope this doesn’t remind you of your classrooms. But there are *some* similarities. We’re trying to condition our students’ behavior: we want them to answer questions right, not wrong; or we want them to do certain things, not others. And Skinner, according to the stories one hears, exploited this analogy in his training of future scientists. He treated his classroom as a Skinner box. In his mind, his role was simply to administer tests, rewarding correct answers with high grades and punishing incorrect ones with low grades, and having students re-take the tests at certain intervals. He was manifestly unconcerned with both the mechanisms bringing about their correct or incorrect answers, and with their conscious lives as they went about the process.

What should we take away from this? Assuming we can agree that this was a flawed approach, where did Skinner go wrong? We can answer this sort of question by thinking more generally about *domain transfer*: the way that we take resources, tools, or strategies from one domain, and apply them in another. Skinner borrowed a framework designed to investigate operant conditioning in animals, and applied the framework to a very different phenomenon: the training of scientists. What went wrong can be understood as a faulty domain transfer: the problem was that the two domains differed in such a way that a strategy successful in one was not successful in the other.

I’m going to stop talking about Skinner, because I don’t imagine you’re tempted by his approach to teaching. The reason I began with his example is that it raises a certain sort of worry. When you read the first two paragraphs, you likely worried that the Skinnerian approach relies on a misconception about student learning. Underlying these worries is the thought that there is some important difference between the *source* domain — psychological theory — and the *target* domain — university teaching — that makes the behaviorist framework ill-suited to pedagogical goals.

So, with an exaggerated version of this sort of worry on the table, I’ll turn to *gamification*. Gamification is “the use of gameplay mechanics [or game design principles] for nongame applications” (Isabelle, 2020), and it’s become a popular and controversial strategy in pedagogy. Gamification’s various successes are difficult to deny, but the empirical literature, and the discussion it generates in pedagogy workshops and seminar rooms, raises precisely the worries I sketched for Skinner’s teaching: however legitimate gameplay mechanics are for their own purposes, they may not be well-suited to our pedagogical goals. These worries can only be partly addressed with empirical methods (as I’ll argue), and I want to take a different approach. I’ll draw some lessons from a broader look at domain transfer and apply those lessons to gamification. I won’t end up endorsing or rejecting gamification — my goal is to offer strategies for understanding the successes andfailures of gamification attempts, and for thinking through instances of gamification as they arise in our own teaching and course design.

Section 2 will briefly review the gamification debate. Section 3 will pivot to discuss an illuminating case of domain transfer. Section 4 will then draw some lessons from that case about how to approach instances of domain transfer, and how to identify and resolve problems with them. And section 5 will apply those lessons to the gamification debates from section 2.

Gamification

In pedagogy, gameplay mechanics and design strategies are generally used to increase student engagement and motivation — those being the pedagogical goals that video games happen to pull off brilliantly. The gameplay mechanics and design principles used are diverse. Some are relatively concrete and straightforward to implement, like “quests, levels, badges, points, leaderboards, virtual goods, avatars, narratives, and progress bars” (Hung, 2017). Some are less straightforward to implement. E.g., it’s been suggested that teachers should borrow the way video game designers structure achievements or quests, in order to design better assessments. You might structure your early assignments the way video game designers build tutorial sections: using short, easy, repeatable tasks to promote player confidence and retention (Miller, 2014, p. 191). And many interesting examples of gamification are far less concrete, like the idea of giving a course an interactive narrative structure by designing and conceptualizing it as a Dungeons & Dragons campaign (Scott, 2020). In each example, tools from game design are supposed to offer some benefit when applied to the classroom.

It’s also common to pitch pre-existing pedagogical best practices — like having clear standards for performance, focused goals, rapid feedback, promotion of student autonomy, cultivation of an engaging social environment — in terms of game design (Miller, 2014, p. 25). But there is debate about specific gamification strategies, and about the general strategy of borrowing tools from game design. I’ll discuss two empirical challenges to gamification below, and then a set of more foundational issues. I’ll return to them, with more to say, in section 5.

Demotivation

Take one of the most commonly used examples of gamification: leaderboards. You probably remember getting to the end of an arcade game and seeing a list of high scores, along with the initials of the person who got them. If you did well enough you were invited to put in your own initials and claim a spot. Contemporary games use leaderboards as well, and they appear to be extremely motivating. Minor celebrities are made on *Runescape* leaderboards — not to mention *Starcraft* and other e-sport games — and top-ranked players of those games continue to play endlessly to take, or keep, a high rank on the leaderboard.

 In some cases this appears to work in classes as well — students show increased motivation when there is a class leaderboard for them to appear on (Hung, 2017). But leaderboards affect different students differently (Codish & Ravid, 2012), motivating some and not motivating others. And in some cases it appears to have no effect class-wide on student motivation, or even to *lessen* motivation class-wide (Codish & Ravid, 2012). Leaderboards work largely because of the sense of competition they engender and the social status they imply, and students might be de-motivated by an over-competitive environment (Codish & Ravid, 2012). And, aside from learning objectives, there privacy concerns with leaderboards. So it isn’t clear when and where leaderboards are a good, useful, and fair teaching tool.

Unimproved learning outcomes

A number of studies — it appears to be a minority, but a significant minority — show unimproved, or even *worsened* learning outcomes with various gamification interventions (Toda, Valle, & Isotani, 2017). This can even happen when student motivation is increased: in some cases learning outcomes, as measured by grades, see no change even when student motivation and engagement, as measured by online participation, downloads of course material, and other participation measures, sees a significant improvement (Barata, Gama, Jorge, & Gonçalves, 2013). One study even found that the more students engaged with the game elements in a course, the worse they performed in the course (Snow, Allen, Jackson, & McNamara, 2015).

Why is this? It may be that students are motivated to engage with the game elements, but only superficially — earning badges, playing around with their avatar — without engaging deeply with the course material (Kocadere & Çağlar, 2015). In that case, gamification would serve short-term, subsidiary goals (participation, course engagement) in a way that actually doesn’t contribute to the longer-term, ultimate learning objectives that we were after.

Foundational problems

Those are two debates about specific gamification strategies, and the extent to which they achieve their goals. I want to also consider a more nebulous set of worries about gamification, discussed by Ian Bogost (2015) and Margaret Robertson (2010). Robertson summarizes the criticism here:

[G]amification isn't gamification at all. What we're currently terming gamification is in fact the process of taking *the thing that is least essential to games* and representing it as the core of the experience. Points and badges have no closer a relationship to games than they do to websites and fitness apps and loyalty cards. They're great tools for communicating progress and acknowledging effort, but neither points nor badges in any way constitute a game. Games just use them — as primary school teachers, military hierarchies and coffee shops have for centuries — to help people visualise things they might otherwise lose track of. They are the least important bit of a game, the bit that has the least to do with all of the rich cognitive, emotional and social drivers which gamifiers are intending to connect with. (Robertson, 2010)

The worry is that gamification is used because it is trendy and easy to implement in superficial ways that don’t reflect the real motivating features of video games. Take, e.g., the way one book on gamification frames its chapters as quests (Kim, Song, Lockee, & Burton, 2018), but poses the quests like this: “Let’s explore engagement and flow theory” (2018, p. 7); “Let’s understand the definition of gamification” (2018, p. 25). Those are fine descriptions of the chapters, but they include none of the features that make quests in a game interesting, motivating, or engaging. They are not clearly defined. They don’t encourage a sense of efficacy and agency in the reader. They don’t pose interesting or challenging deliverables, let alone deliverables calibrated to sit at the very border of the player/reader’s competence, where challenges are known to be most engaging, rewarding, and instructive (Kocadere & Çağlar, 2015).

 An independent worry derives from the way gamification works in other domains. Lottery devices, like slot machines, are heavily gamified, and don’t promote any sort of deep engagement. They hook their users through the same kind of elements that simple games do — carefully calibrated reward structures, the opportunity for large payoffs, lots of near-misses and low payoffs, and engaging patterns of light and sound. The machines are exploitative, which is an important worry. But leaving that aside, they rely exclusively on extrinsic motivations, never offering the user a chance to engage deeply with anything beyond the external rewards, or to tie in their intrinsic motivations. The same book I discussed in the last paragraph offers another example. It asks how you might convince your children to do their math homework when they don’t want to. Answer: turn that homework into a game, with something they like as the reward. Does this sound like a good idea? If you just want them to get this round of homework done, yes. But if you want them to develop a deeper interest in mathematics, probably not. If you want to connect mathematics to their lives and their intrinsic motivations, to have them learn to *use* mathematics on problems that mean something to them, to show them how to illuminate problems they care about using mathematics, definitely not.[[1]](#footnote-1)

 So it might look like I’m heading towards a clear suggestion: don’t gamify your courses! At least not unless you’re going all in, doing the hard work to integrate the difficult features of game design that make games so engaging, and making sure those features fit organically with the intrinsic motivations of your students and the important features of your subject matter. But empirical work does suggest that shallower sort of gamification works, if not always. The question is where and why it works. Most studies of gamification call for more empirical work on the question. But the problem is difficult to resolve empirically because there is such a wide variety of game elements that can be used, so many ways they can be implemented, and such diverse contexts and circumstances they can be implemented *in* — different types of courses, students, disciplines, background pedagogical strategies, extents of gamification or number of game elements used, and so on (Hamari, Koivisto, & Sarsa, 2014; Hung, 2017; Majuri, Koivisto, & Hamari, 2018; Toda et al., 2017).

So if we want some practical advice on when and how to gamify our courses in their particular contexts, we need more than empirical work. We need strategies for thinking through gamification in whatever context we encounter it. I’m going to set out some recommendations to this effect by, first, considering the broader strategy that gamification is an example of: domain transfer. I’ll describe a non-educational case of domain transfer in detail before drawing out some lessons and applying them to gamification.

**Surgical precision**

Domain transfer occurs whenever we take resources, tools, or strategies from one domain, and apply them in another.To draw out some of the general features of domain transfer I’ll discuss a case study. The case concerns doctors at Great Ormond Street Hospital for Children (GOSH) revising their procedures for transferring patients from the surgical room to the intensive care unit (ICU). This journey is high-risk for the patient (Sower, Duffy, & Kohers, 2008, p. 1). There is important information to be communicated by an (often) exhausted surgery team. There are complex technological and support systems to be set up. And there is a large team operating in limited space to make this handoff happen. Failures in information transfer or support system setup can be deadly. Clashes in the tight space can reduce efficiency and increase exhaustion, contributing to more serious errors. To rethink the handoff, two doctors at GOSH consulted a couple unlikely sources: Ferrari’s Formula One pit crew and a dance choreographer.

 GOSH’s goal was to reduce the risk involved in the handoff from surgery to ICU. They identified some human factors — exhaustion and lack of information — that made the journey high-risk. Those factors caused many of the errors in the setup of technology and support systems, along with communication errors. And the communication errors themselves caused errors in support system setup. Two GOSH doctors recognized that a Formula One pit crew has an analogous problem: communicating a complex array of information and configuring a set of technological systems safely and efficiently. And they tend to do this by structuring the process so that human factors like exhaustion and lack of information do not arise, or do not cause problems if they do arise. So the doctors reached out to Ferrari’s Formula One pit crew.

The first thing they discovered was that the crew did a lot of planning using a *Failure Mode and Effects Analysis* — a common strategy in risk management, used to anticipate and prepare for potential problems in a project or process (Edsel, 2016). The doctors also noticed that the pit crew relied on detailed *process maps* — flow charts of their task and its different interacting sub-tasks — to decide how to assign roles to the members of the crew. Both of these strategies are common and domain-general, making them well-suited to the doctors’ goals. But the doctors borrowed more specific strategies as well. Most importantly, they saw how important *prediction*, *modularity*, *routine*, *practice*, and *hierarchical organization* were to the pit crew. The FMEA told the crew what problems to predict, and they eliminated those problems or set up procedures in advance to deal with them. They used a modular, unchanging routine so that lack of information could not derail the process, and they practiced that routine often and rigorously to ensure that the crew performed well even when exhausted. To ensure smooth handling of problems there was a hierarchical structure to the routine, with one person — the “lollipop man” — in charge,[[2]](#footnote-2) keeping overall control of the process while everyone else focused on their particular role in it.

 Using these strategies, and input from the pit crew itself, the doctors set up a new protocol for patient transfer that reduced errors overall, and greatly mitigated the problem of informational errors causing errors in support system setup. They created a process map to understand the handoff, and assigned roles to surgical staff following the strategies above. They used FMEAs to identify potential problems in a handoff and prepare for them. They organized their teams following the pit crew’s structure, including the lollipop man, and had the teams practice their routine carefully. And because their process maps were more complex and intricate than the pit crew’s, they consulted dance choreographers on strategies for coordinating movement and maintaining space between team members in a confined area. The process was a massive success.

 Many things didn’t transfer, though. GOSH doesn’t have Ferrari’s resources, and can’t devote as much time to practicing their routine. This is a big deal — rigorous practice was an important part of what made the pit crew’s process so consistently successful. This is further complicated by the fact that the surgical team’s routine had to be more flexible and therefore less modular than the pit crew’s. Patients and their surgical complications come in more varieties than pit stops do, so the process had to leave room for that variety, and the hospital’s version of the lollipop man had to take on a more active role in planning and coordinating individual handoffs. That variety also means that *prediction* meant something different for GOSH. There are too many possible problems to fully account for in planning. This might mean that the person in charge of a particular handoff has be given more time to devote to the case, or that there need to be robust procedures for generating solutions when obstacles arise. In either case, the parallel between the pit stop and the surgical handoff breaks down in places, and it was important for GOSH to recognize this so they could develop their own solutions.

**Lessons and recommendations**

What can we take away from all this, aside from a greater appreciation for pit crews? I want to draw out the elements of a well-designed domain transfer. In the next section I’ll apply them to gamification.

*(1) Identify your goals in the target domain.* The doctors wanted to improve the safety and efficiency of their surgical handoffs, partly by making the process more efficient and reducing strain on the members of the handoff team. These were the goals they needed new strategies for, and the goals against which those strategies would be measured against. They thought they could achieve those goals by eliminating human factors (exhaustion or misinformation) or mitigating the influence of those factors, so those proximate goals were the doctors’ main focus.

*(2) Identify strategies used in the source domain to achieve the same or similar goals.* The doctors found general strategies in the pit crew’s methods, like FMEAs and process mapping, along with specific ones like modular hierarchical organization, repetitive practice, and the clear delineation of roles. In the source domain, those strategies served to increase efficiency and reduce mistakes, making the pit stop safer and more efficient. And they did this by eliminating human factors like exhaustion and misinformation, or mitigating the influence of those factors. This is a perfect match — the doctors found resources that did in the source domain exactly what they wanted to do in their target domain.

*(3) Identify the features of the source domain make those strategies successful, and ask whether the target domain has those same features, or analogous ones.* If it doesn’t, you have an obstacle. In the case above, the pit crew’s strategy of using modular roles worked because the routine could be practiced rigorously to eliminate errors. If it couldn’t, tight modular organization might have caused problems — one person’s errors wouldn’t be corrected because they wouldn’t be apparent to the rest of the team. GOSH couldn’t use the same amount of repetition, so the features that made modular organization work in the source domain were not present in the task domain: a reason to suspect the domain transfer would fail.

Ferrari’s approach to task assignment also depended on the process’s relative simplicity and lack of variation: it *could* be broken down into tight, exhaustively defined, modular roles. GOSH’s process was complex by comparison— another reason to suspect the pit crew’s strategies wouldn’t transfer successfully. And, independently of this, the tightly-defined roles would have meant an inability to deal with the variation the surgical team faced. It was essential to notice these problems. Tight, modular roles would have spelled failure for GOSH.

 This third step can be treacherous. Disanalogies are hard to spot if we don’t yet know what features of the source domain make the strategy successful. More insidiously, we might be blind to certain disanalogies. In the first step of an FMEA, like the one Ferrari’s team ran, the whole team brainstorms every potential way their project could fail, however unlikely or silly it may seem. This depends on an open and supportive environment. An instructor looking to use this strategy in a classroom will have difficulties if they’re not aware that their students experience the classroom as less open and supportive than it appears to the instructor [Brookfield].

 Disanalogies may arise in another way, too. They might not interfere with the ability of a strategy to achieve your current goal — e.g., increasing student attendance — but nonetheless interfere with your more ultimate goals. A university course is like a slot machine in that you want to make it a routine for your students to attend it, you want them to think about it often and to be engaged with it, and you want them to be motivated to keep coming to it. You could improve student attendance by using the techniques a slot machine does. The disanalogy is in the effect on your *other* goals — namely, any goals you might have for a university course aside from attendance. The kind of attendance a slot machine encourages might interfere with the kind of deep, careful thinking necessary to develop the competence and skills we are usually trying to inculcate in our students. Slot machines and university courses are analogous in the respects relevant to one attendance-increasing strategy, but importantly disanalogous in respects relevant to more important pedagogical goals.[[3]](#footnote-3)

 (3) is arguably the most important and difficult step so far. And an important part of (3) is to solicit feedback from as many and as diverse sources as possible to overcome blind spots and missed disanalogies). As far as possible, the feedback should be directed explicitly at the potential analogies and disanalogies between source and target domain (e.g., “How open and supportive is this environment?”, “Are you comfortable expressing thoughts even if you think they might sound silly?”) and the way they could affect the success of the transferred strategy.

*(4) Identify ways to compensate for the resulting shortcomings, or, if this is not possible, weigh those shortcomings against the domain transfer’s advantages.* GOSH compensated for their relatively complex, difficult-to-practice, and unpredictable process in a few ways. They consulted a dance choreographer to streamline the process and reduce the potential for errors in their complex movements. They created longer and more detailed guidelines than the pit crew had, and gave more responsibility to their analogue of the lollipop man to guide the team through situations that could not be planned for. This was not ideal — it did not result in the success rate of Ferrari’s pit crew. But it resulted in a significantly improved success rate, so the shortcomings could be readily accepted.

Your way of compensating for your strategy’s shortcomings will likely involve changes in either the strategy itself or something else — GOSH modified the pit crew’s strategies for their own purposes, and they revised various other aspects of the surgery-to-ICU handoff (e.g., staffing and training procedures) to make their new strategies work. With these changes, (3) needs to be revisited — the changes may require new, so-far-unconsidered assumptions to hold in your target domain, and you’ll have to identify those assumptions and check that your target domain meets them. So you may have to loop back from (4) to (3) a number of times.[[4]](#footnote-4)

*(5) Try the new strategies out in the target domain, preferably in a low-stakes environment.* It would have been alarming to see GOSH implement the new guidelines immediately in a high-risk scenario. They would have instead been tested in low-stakes contexts. In addition to this, they may have introduced the parts of their strategy one at a time. In pedagogy we might try introducing badges or some quest-like assessments on a first run, rather than fully gamifying a course, with all the bells and whistles, all at once.[[5]](#footnote-5)

**Gamification as an example of domain transfer**

In this final section I’ll revisit the debates I introduced in section 2, applying the general approach to domain transfers I’ve just discussed. I won’t *settle* the debates. As I said above, the applicability of a gamification strategy depends on far too many details of its context to be fruitfully discussed in simple yes-or-noterms. Instead, we need some general strategies that can be used to think through any instance of gamification. I’ll show that the steps in the previous section are just such a strategy, by applying them to the problems I considered in section 2.[[6]](#footnote-6)

Demotivation

I started, in section 2, with the problem of demotivation, focusing on leaderboards. Gamification methods can have exactly the opposite of their touted effects, leaving students less motivated than before. Should you worry that this will happen in your course if you use a leaderboard? Well, start with step (1). You want to increase students’ motivation to engage with the course — simple enough. Step (2) comes quickly too — leaderboards in games *are* motivating (if not the main motivating factor). So we have a good match so far. What about step (3)? How do leaderboards increase player motivation? By introducing the extrinsic reward of a location on the leaderboard — rewarding primarily because of the social status it confers. Since your students are social creatures, you’re part-way through (3) — they should be as motivated by social status as any game player.

But there are disanalogies to consider. The type of skill that leaderboards and potential social status are good at fostering might differ from the skills you’re trying to foster in your students. E.g., imagine one of your learning objectives is for students to become better at participating in group inquiry, shared projects, and group discussion. It’s plausible that a leaderboard spotlighting individual students would interfere with the more collaborative goal.

There are also other disanalogies to worry about. In games, leaderboards are mostly anonymous for players not in the top 10, top 100, or what-have-you. This increases the visibility of success while reducingthe visibility of failure. This is likely important — I don’t think I would keep playing a game that broadcasted my failures to every other player, especially if I wasn’t very good at it. And I would feel less comfortable taking the kind of risks that improvement in the game might require me to take. This resulting lack of motivation and engagement transfers straightforwardly to the classroom, and it is worrying for obvious reasons. It may be most worrying if I knew the people on the leaderboard or spent time with them — so it’s not such a problem in a MOOC.

You might just drop the leaderboard strategy here, but there are other options. You could to compensate for these problems — moving on to (4) — by using a leaderboard with just a few top positions shown, broadcasting success *without* broadcasting failure. Of course that raises further questions. In my experience with real games, a small leaderboard isn’t that motivating unless I’m good enough to get on it. *Then* it’s fun to fight for top spots, but otherwise the leaderboard doesn’t figure into my motivations at all. If that generalizes, then a top-few leaderboard would just reward already-high-performing students, rather than motivating the students who need the most help. There may be ways of compensating for this — I don’t want to chase all the options down. The point is that you can work through those possibilities the way we’ve done here, going through (1)–(4) and eventually implementing them as in (5). You identify your goals, and some tools that achieve similar goals in other domains. Then you ask about the conditions that make it possible for those tools to achieve their goals in the source domain. If your course doesn’t also meet those conditions you can try to change it so it does, or change the tool so it requires only conditions you do meet. As I said in the last section, you may need to loop back between (3) and (4) a number of times. And throughout this you’ll need to think about your various *other* goals for the course, and whether the use of your new tools requires or introduces conditions that make it more difficult to achieve those other goals.

Unimproved learning outcomes

The second example of a problem with gamification was that it sometimes led to improved motivation or engagement with no change in learning outcomes. Is this problem going to arise in your course? Again, it will depend on the particularities of your course, but the approach above is a good way of thinking it through. Say you are interesting in improving student motivation and engagement, and you notice that *avatars* seem to do this in games.

That’s (1) and (2) taken care of. But will avatars promote increased engagement with course material, rather than just engagement with the social environment or with the avatars themselves? Well, in games what features of the avatars, and the games’ broader context, allow them to do the former rather than the latter? Consider Dungeons & Dragons players, many of whom spend hours and hours fiddling with miniatures (the game’s avatars: small physical statues of the characters) just for the fun of designing miniatures. These things are *extremely* customizable, and it can be quite fun to design them. If that’s the extent of your avatars’ analogy with D&D miniatures (or avatars more broadly) it looks like you’re not going to get the deep engagement you want. But designing a miniature for a D&D character can also be a way of crafting your character, thinking through their history, and representing their motivations and peculiarities in a way that deepens your engagement, through them, with the game. The avatar itself might motivate engagement with nothing deeper than the avatar itself, but if it's implemented correctly it can pull a player, through the personality they’ve been able to express in the avatar, into deeper engagement with the game or course itself. *This* is a more helpful target — this is one thing you can try to recreate in your course to make sure the avatars have their intended effect. We know students learn more when they understand how course material is relevant to them, when it’s made meaningful to them, and when they feel some personal connection to it. If their avatars allow students to bring their identity (and history, motivations, peculiarities) into the context of the course, in a way that ties into the course and can be developed through the course, we have a good analogue of the features that make miniatures and avatars successful at promoting deep engagement with a game, rather than superficial engagement with the avatars themselves. And again, we got here by considering the analogies and disanalogies between the course and the games it borrows from, and by shaping our course so that the use of game elements so brings in the features of games that do the real, deep work we want the borrowed tools to do.

Foundational problems

The last set of problems I considered were more nebulous, and I won’t go through them step-by-step like I did in the previous sub-sections. The main problems I’ve identified with gamification are to do with its pulling too superficially from game design, as Robertson argues. But the empirical literature shows that some of those superficial tools are helpful, and the process above is, I think, a good way of understanding why. We can identify genuinely helpful tools, including ones that are not essential to games, in our own course planning. But the process above does pull us deeper into game design and the deep reasons games are motivating and engaging — beyond the more superficial tools. So it should also press us to take Robertson’s point seriously, and also to consult game designers and game experts, which is rarely done in gamification attempts (Robertson, 2010) — they’re the best source for an understanding of how and why games work.

There are other general concerns, e.g. whether gamification on the whole tends to introduce extrinsic motivators that crowd out the intrinsic ones we want to promote. But if it does, that’s a disanalogy between the goals of pedagogy and those of game design, and one that we should be able to identify if we think through an instance of gamification the way I’ve outlined above.

So the upshot, as I said, is not a yes or no answer to gamification. Sometimes gamification works; sometimes it doesn’t. The upshot is that we should use steps like the ones above for handling gamification. We should look deeper than game elements, even ones that are successful in their home domains. We should look to the conditions that make game elements successful, and we should seek analogies to those conditions in our courses rather than just pulling tools from game design out of their context and hoping they’ll work in a new one. That will pull us deeper into the “rich cognitive, emotional and social drivers” games use, as Robertson urged. And it will force us to be more intentional with our tools, and more aware of the way they serve our pedagogical goals.[[7]](#footnote-7)

**Works Cited**

Barata, G., Gama, S., Jorge, J., & Gonçalves, D. (2013). Improving Participation and Learning with Gamification. *Proceedings of Gamification, 2013*, 10–17.

Bogost, I. (2015). Why gamification is bullshit. In S. P. Walz & S. Deterding (Eds.), *The Gameful World* (pp. 65–80). Cambridge MA: MIT Press.

Codish, D., & Ravid, G. (2012). Personality based gamification: how differente personalities perceive gamification. In *Proceedings of the 22nd European Conference on Information Systems*.

Edsel, A. (2016). *Breaking Failure*. New Jersey: FT Press.

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does Gamification Work? — A Literature Review of Empirical Studies on Gamification. *Proceedings of the 47th Annual Hawaii International Conference on System Sciences*, *January*, 3025–3034.

Hung, A. C. Y. (2017). A critique and defense of gamification. *Journal of Interactive Online Learning*, *15*(1), 57–72.

Isabelle, D. A. (2020). Gamification of Entrepreneurship Education. *Decision Sciences Journal of Innovative Education*, *18*(2), 203–223. https://doi.org/10.1111/dsji.12203

Kim, S., Song, K., Lockee, B., & Burton, J. (2018). *Gamification in Learning and Education*. *Gamification in Learning and Education*. Springer. https://doi.org/10.1007/978-3-319-47283-6

Kocadere, S. A., & Çağlar, Ş. (2015). The design and implementation of a gamified assessment. *Journal of E-Learning and Knowledge Society*, *11*(3), 85–99. https://doi.org/10.20368/1971-8829/1070

Majuri, J., Koivisto, J., & Hamari, J. (2018). Gamification of education and learning: A review of empirical literature. *CEUR Workshop Proceedings*, *2186*(GamiFIN), 11–19.

Miller, M. (2014). *Minds Online: Teaching Effectively with Technology*. Cambridge MA: Harvard University Press.

Robertson, M. (2010). Can’t Play, Won’t Play. *Kotaku*.

Scott, R. (2020). Teaching Ethics with Dungeons & Dragons. *Blog of the APA*. Retrieved from https://blog.apaonline.org/2020/03/11/teaching-ethics-with-dungeons-dragons/

Snow, E. L., Allen, L. K., Jackson, G. T., & McNamara, D. S. (2015). Spendency: Students’ Propensity to Use System Currency. *Journal of E-Learning and Knowledge Society*, *11*(3), 407–427. https://doi.org/10.1007/s40593-015-0044-1

Sower, V. E., Duffy, J. A., & Kohers, G. (2008). Ferrari’s Formula One Handovers and Handovers From Surgery to Intensive Care. *The American Society for Quality*, (August), 1–5. Retrieved from www.asq.org

Toda, A. M., Valle, P. H. D., & Isotani, S. (2017). The dark side of gamification: An overview of negative effects of gamification in education. In *Higher Education for All. From Challenges to Novel Technology-Enhanced Solutions* (pp. 143–156). Springer International Publishing. https://doi.org/10.1007/978-3-319-97934-2\_9

1. [Another potential issue here is that game design is *really hard*, and it’s plausible that to use its tools profitably in education would require as much expertise and effort as using them in game design itself. Points to collaboration, rather than just borrowing tools?] [↑](#footnote-ref-1)
2. He holds a big paddle, shaped like a lollipop — probably for some good reason. There’s only so much research one man can do. [↑](#footnote-ref-2)
3. [Some disanalogies might result from gamification itself, as a broader strategy. Something here about looking at how the *extent* of gamification affects the course — one Jeopardy-style review session vs a D&D-style course.] [↑](#footnote-ref-3)
4. [Flag that you may make changes *to your learning objectives*, and a consideration of this could figure in. In general, the new learning objectives will be fine *iff* they make sense as learning objectives independently of gamification. You want to be on the lookout for places where the skills you’re requiring of your students are more to do with games than subject-matter competence.] [↑](#footnote-ref-4)
5. [This isn’t going to work if the benefit comes from *immersion*, like (maybe) in a D&D-style course.] [↑](#footnote-ref-5)
6. [This section should maybe include a deeper example of gamification — maybe a D&D course. The small interventions aren’t as interesting, though they’re much more popular. The deeper example could be a way of giving more detail about game design and the way games motivate.

Also, have to find the line between showing that the approach is sensitive to other features of a pedagogical context (active learning vs certain game elements, e.g., or different background pedagogical strategies — decoding the disciplines with/vs gamification?) without going into too much detail about them.] [↑](#footnote-ref-6)
7. [Note at end on two considerations the above raises. (1) If we look more closely at games we can look more closely at non-traditional games, e.g. ones without goals (Minecraft, walking simulators, undertail, games that challenge usual gaming assumptions?). (2) Collaboration with game designers rather than just borrowing tools — *difficulty* of game design.

*Maybe* also a note about Devin’s point: gamification could start not from tools but *from* the deeper features — to do with the psychology of the game players — that make those tools successful. Not sure this should still be called gamification, and not sure there’s *that* much to learn from this that isn’t gotten from the kind of psychology that pedagogy research pays attention to. But maybe worth exploring.] [↑](#footnote-ref-7)